



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

November 22, 1983

Honorable Nunzio J. Palladino
Chairman
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Dr. Palladino:

SUBJECT: ACRS REPORT ON THE EXPANDED SYSTEMATIC EVALUATION PROGRAM
INTEGRATED PLANT SAFETY ASSESSMENT OF THE BIG ROCK POINT
PLANT

During its 283rd meeting, November 17-19, 1983, the Advisory Committee on Reactor Safeguards reviewed the results of the Systematic Evaluation Program (SEP), Phase II, as it has been applied to the Big Rock Point Plant. This matter was discussed also during subcommittee meetings in Traverse City, Michigan on September 20-21 and in Washington, D.C. on November 7, 1983. During our review, we had the benefit of discussions with representatives of the Consumers Power Company (Licensee) and the NRC Staff, and comments from members of the public. We also had the benefit of the documents referenced.

The Big Rock Point Plant was constructed in 1960-62 and began commercial operation in December 1962. It received a full-term operating license in May 1964. It is the second oldest commercial nuclear power plant still operating in the U. S and, at a rated electrical output of 75 MWe, it is the second smallest.

The SEP evaluation of the Big Rock Point Plant initially was carried out in the same manner as for the plants previously reviewed. Of the 137 topics to be addressed in the SEP, 29 were not applicable to the Big Rock Point Plant and 23 were deleted because they were being reviewed generically under either the Unresolved Safety Issues (USI) program or the Three Mile Island (TMI) Action Plan. Of the 85 topics addressed in the NRC Staff's review, 53 were found to meet current NRC criteria or to be acceptable on another defined basis and two were resolved during the review. We have reviewed the assessments and conclusions of the NRC Staff relating to these topics and have found them appropriate.

The 30 remaining topics involved 53 issues relating to areas in which the Big Rock Point Plant did not meet current criteria. These issues were addressed by the Integrated Plant Safety Assessment and various corrective actions were considered or proposed by the Licensee and by the NRC Staff. However, during this review of the SEP-related issues, the Licensee requested that the Integrated Assessment be expanded to include many of the

pending licensing actions for Big Rock Point that were related to requirements outside the scope of the SEP review. These additional issues included many of the USI and TMI Action Plan items that had been excluded earlier from the SEP review as well as other multi-plant actions. The list of items submitted by the Licensee included modifications intended to improve reliability or availability or to reduce occupational exposures. For the most part, these modifications were not "safety related" but some were considered by the NRC Staff to be "important to safety." The 43 issues proposed by the Licensee were assigned priorities based primarily on a plant-specific probabilistic risk assessment (PRA) performed by the Licensee and his contractor.

The NRC Staff agreed to include these issues in the expanded assessment proposed by the Licensee and, after a review of all pending licensing actions for the Big Rock Point Plant, added 16 issues to the list. The total number of issues considered in the Integrated Plant Safety Assessments by the Licensee and the NRC Staff was 112.

For 50 of the 112 issues included in the Integrated Assessment, the NRC Staff concluded that no backfit is required. For 16 of the remaining issues, changes to the Technical Specifications or procedures were recommended by the NRC Staff and agreed to by the Licensee.

For 14 issues, the Licensee has proposed hardware backfits for their resolution and the NRC Staff has found these proposals acceptable. Four of these issues were related to SEP topics; the others were from the expanded list of non-SEP topics, and three of these involve modifications that are not "safety related."

As has been the case for the other plants in the SEP, the Integrated Assessment has not been completed for a number of issues, for which the Licensee has agreed to provide the results of studies, analyses, and evaluations needed by the NRC Staff for its assessments and decisions. All of these issues are of such a nature that hardware backfits may be required for their resolution. The resolution of these issues will be addressed by the NRC Staff in a supplemental report.

Many of the issues still being evaluated by the Licensee relate to the effects of extreme environmental phenomena, especially earthquakes and tornadoes, since the Big Rock Point Plant was not designed to resist these phenomena at the levels that would be required by current criteria.

The Licensee's proposal to upgrade the seismic resistance of the Big Rock Point Plant to the level of 0.12g proposed by the NRC Staff is notably different than what has been required or done for the other SEP plants. The Licensee has indicated that, for a plant of the size and age of Big Rock

Point, it is not economically feasible to perform the analyses required to demonstrate seismic capability and quantify analytical uncertainty. Instead, the Licensee has proposed to evaluate the seismic resistance of equipment important to safety using a combination of probabilistic and deterministic methods. Then, on the basis of this evaluation, the Licensee proposes to selectively upgrade the "weak links" in the systems and structures required to mitigate accidents that would be expected to result from seismic events. The NRC Staff has concluded that this approach is reasonable for the Big Rock Point Plant and, if properly executed, it would provide adequate seismic resistance. We agree.

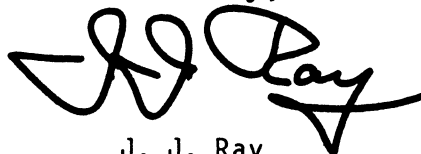
Use was made of a limited PRA in connection with the NRC Staff's evaluations. Since a plant-specific PRA was available for the Big Rock Point Plant, the technique used was somewhat different than that used for other plants in the SEP for which a plant-specific PRA was not available. The chief difference was that the NRC Staff was able to assign priorities based on the reduction in doses that could be attributed to the proposed modification. We believe that the NRC Staff's use of PRA was appropriate and that suitable use was made of the results.

Our conclusions regarding the SEP review of the Big Rock Point Plant are as follows:

1. The actions taken thus far by the NRC Staff in its expanded assessment of the Big Rock Point Plant are acceptable.
2. We will expect to review the results of the evaluations that are being made and the proposals and schedules for modifications that will result from them.
3. In evaluating the seismic capability, as noted above, assessment of the seismic capacity of weak links will prove to be complex, and care will be required to accomplish an appropriate degree of conservatism (adequate margins) in the light of uncertainties in such capacities. The ACRS expects to review this aspect in detail as part of its evaluation as to whether an acceptable level of risk exists following the modifications.

Dr. William Kerr did not participate in the Committee's review of this matter.

Sincerely,

A handwritten signature in black ink, appearing to read "J. J. Ray". The signature is stylized with large, sweeping loops and a prominent "R".

J. J. Ray
Chairman

References:

1. Consumers Power Company, "Final Hazards Summary Report for Big Rock Point Plant," Volumes 1-2, dated November 14, 1961
2. U. S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, "Integrated Plant Safety Assessment, Systematic Evaluation Program, Big Rock Point Plant," USNRC Draft Report NUREG-0828, dated September 1983
3. Letter from Ms. Christa-Maria, Subject: Big Rock Point Plant SEP, prepared for ACRS Subcommittee meeting September 21-22, 1983
4. Letter from Martha Drake and Gerald A. Drake, Subject: Big Rock Point Plant, dated October 1, 1983